Young adult women smokers' response to using plain cigarette packaging: A naturalistic approach

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Abstract

Objectives: To explore young adult women smokers' response to using dark brown 'plain' cigarette packs in natural settings and whether plain packaging is associated with any short-term change in smoking behaviour.

Design: A naturalistic approach. Participants used plain cigarette packs provided to them for one week and their own fully branded packs for one week, but otherwise smoked and socialised as normal. Participants completed questionnaires twice a week.

Setting: The six largest cities and towns in Scotland.

Participants: 301 young women smokers were recruited, with a final sample of 188 (62.5%). To meet the inclusion criteria women had to be between the ages of 18 and 35, daily cigarette smokers, and provide a breath sample to confirm smoking status.

Primary and secondary outcome measures: Pack perceptions and feelings, feelings about smoking, salience and perceptions of health warnings, and avoidant and cessation behaviours.

Results: In comparison to branded packaging, plain packaging was associated with more negative perceptions and feelings about the pack and about smoking ($p<0.001$). No significant overall differences in salience, seriousness or believability of health warnings were found between the pack types, but participants reported looking more closely at the warnings on plain packs and also thinking more about what the warnings were telling them ($p<0.001$). Participants reported being more likely to engage in avoidant behaviours, such as hiding or covering the pack ($p<0.001$), and cessation behaviours, such as foregoing cigarettes ($p<0.05$), smoking less around others ($p<0.001$), thinking about quitting ($p<0.001$) and

reduced consumption ($p<0.05$), when using the plain packs. Results did not differ by dependence level or socio-economic status.

Conclusions: No research design can capture the true impacts of plain packaging prior to its introduction, but plain packaging may help to reduce cigarette consumption and encourage cessation in the short-term.

ARTICLE SUMMARY

Article focus

- How young adult women smokers respond to using plain cigarette packaging, in comparison to fully branded packaging. We explored the impact of plain packaging on short-term smoking related behaviour

Key messages

- Plain packaging was associated with lower ratings of enjoyment and satisfaction of smoking in comparison with fully branded packaging
- Participants reported looking more closely at the health warnings on plain packs and also thinking more about what the warnings were telling them
- Plain packaging, in comparison with fully branded packaging, was associated with forgoing cigarettes, smoking less around others, increased thoughts of cessation and reduced consumption

Strengths and limitations

- The main strength of the study is that it allows an insight into how smokers respond to plain packaging before it has been introduced
- The main limitations are the novelty of the plain packaging and reliance on self-reported smoking behaviour

Introduction

At the annual meeting of the Canadian Medical Association in 1986 it was proposed that all tobacco products should come in 'plain' brown standardised packs in order to minimise their attractiveness.[1] A quarter of a century on and plain tobacco packaging will be introduced for all tobacco products in Australia from December 2012. Prior to this consultations on plain packaging ended in New Zealand in October and in the United Kingdom (UK) in August. What the actual impacts of plain packaging will be, if any, remains to be seen however. A recent systematic review of the plain packaging literature, with 37 included studies, suggests that plain packaging may have a number of potential public health benefits, including: 1) reducing the appeal of the pack, product and user, 2) increasing the salience, believability and seriousness of the health warnings, although this was influenced by the type (pictorial or text), size and strength of the warnings used, and 3) increasing perceptions of harm, although this was dependent upon the colour of the plain pack, with darker coloured plain packs typically perceived as more harmful, and lighter coloured plain packs less harmful, than fully branded cigarette packs.[2]

One of the longstanding criticisms of the literature is that existing research typically involves gauging consumer response to plain packaging following brief exposure in a controlled environment and, as a result, fails to capture how consumers would react to and use plain packs over time in naturalistic settings. To date only one study has attempted a real world test of plain packaging, using a design which involved young adult smokers in Glasgow (Scotland) transferring cigarettes from their own packs into plain packs provided and using these packs instead of their own packs for two weeks, and their own packs for two weeks to allow for comparison.[3] Pack perceptions and feelings, and feelings about smoking, were more negative for plain packs, and participants were more likely to report avoidant behaviours (e.g.

covering the pack) and cessation related behaviours (e.g. thinking about quitting) when using the plain packs. The pilot nature of this study, recruitment within a single city and relatively small final sample (N=48) means that further research is needed to test these findings.

We aimed to extend this previous study with a larger and more nationally distributed sample of young adult women smokers. While high rates of smoking among women tend to be the norm in most of Europe, with a prevalence of 20% or more in all but four of EU member countries (Italy, Portugal, Slovakia and Sweden), this contrasts sharply with much of the rest of the world.[4] Prevalence of smoking among women is less than 20% in the Middle East, North and Central America and Asia (excluding Lebanon and Nepal), and less than 10% in Africa, where figures are available.[4] In the UK smoking prevalence among women is currently 20% and in long-term decline, but even so prevalence remains particularly high for young adult women, with 25% of 25-34 year old women and 30% of 20-24 year old women smokers.[5]

The high smoking rates among young women in the UK represents a significant future burden of both mortality and morbidity should this trend not be reversed. With a growing number of slim, elegant cigarette packs targeted at young women being brought to market in the UK and elsewhere within the last five years, and given that the aesthetic appeal of cigarette packaging appears to be more important for young women than for young men,[3,6,7] plain packaging may have a role to play in reducing the high rates of smoking among young women. This study explored young women's experiences of using plain cigarette packaging as they went about their everyday lives.

Methods

Design and sample

Between June 2011 and March 2012 young adult female smokers (N=301) were recruited from eight postcode sectors from within the six most populated towns and cities in Scotland (Glasgow, Edinburgh, Aberdeen, Dundee, Paisley, East Kilbride) using random location quota sampling. The postcode sectors were randomly selected, stratified by DEPCAT score, which is a measure of multiple deprivation, to ensure coverage of a range of socio-economic backgrounds. Within each postcode sector market recruiters were instructed to recruit either six or seven participants, using the door knock method, according to quota controls on age (18-24 / 25-35) and daily consumption (light, moderate smokers were defined as those smoking 14 cigarettes a day or less / heavy smokers as those smoking 15 cigarettes a day or more). All potential participants were informed by market recruiters, who were briefed about the study protocol but blind to the purpose of the study, that the study was concerned with smokers' opinions of cigarette packaging. If individuals were willing to participate and available for the duration of the study, they were asked to complete a recruitment questionnaire, which included the Fagerström Test for Nicotine Dependence[8] and questions regarding risk perceptions and cessation behaviour (e.g. motivation to quit, attempts to quit). To ensure only smokers were recruited participants were asked to provide a breath test using a piCO^{+}™ Carbon Monoxide monitor (Bedfont Scientific) and also an empty cigarette pack; in the four instances where a participant only had a full pack, recruiters took a photo of their pack and texted this to a member of the research team. Ethics approval was obtained from the ethics committee of the Marketing Department at the University of Stirling. Participants provided informed consent before taking part.

Materials and procedure

Participants were informed about the study protocol by market recruiters and, if they gave consent, were provided with a 'completion' pack. The completion pack contained: seven brown (plain) packs with a fictitious brand name Kerrods, to prevent copyright breach, but all relevant legal markings and a barcode; five numbered questionnaires labelled by day and date; a timetable explaining when to use their own packs and the Kerrods packs and when to complete and return each questionnaire.

The study ran for two weeks. For either the first or second week, participants were instructed to transfer cigarettes from their own pack into the Kerrods packs supplied to them and use these; ordering was randomised with half using the plain pack in the first week and half in the last week. In the UK cigarettes contain one of two text health warnings used on the front ('Smoking kills' or 'Smoking seriously harms you and others around you') and one of fourteen 'pictorial' warnings used on the reverse panel, although three are in fact text warnings as they do not display a picture, photo, pictogram or symbol. All the Kerrods packs had the same warning on the pack front (Smoking kills) and one of three 'pictorial' warnings on the reverse panel; a set of healthy and diseased lungs, an image of smoke in a child's face, or a text warning about seeking help (see Figure 1). Past research has found these three warnings to have high, medium and low salience among smokers[9] and they were used to reflect the types of warnings which smokers receive on packs.

Figure 1 here

Participants were instructed to complete questionnaires twice a week (each Thursday and Sunday) and return them via pre-addressed envelopes or by email, see Appendix 1 for questionnaire used. This resulted in two questionnaires relating to their experience of the

plain packs and two relating to their own pack; questionnaire number 5 included the same questions as the pre-study questionnaire about risk perceptions and cessation behaviour, but is not included in this analysis. Although the day and date each questionnaire was to be completed and returned was highlighted on the front cover and specified in the timetable, in an attempt to increase study compliance a text message was sent to each participant the day before study onset, always a Sunday. The text reminded participants: 1) that the study would start the next day, 2) what packs they were to use for the coming week, and 3) to complete questionnaire 1 the following Thursday (the day and date was given for clarity). A second text message was sent the following Sunday to remind participants to complete and return questionnaire 2 that day, and on which packs to use for the following week. A third and final text was sent the subsequent Sunday, reminding participants to complete and return questionnaires 4 and 5 that day. Participants were also sent a reminder letter during the first week of the study and an email was sent every Thursday and Sunday morning to participants who had provided an email address as an additional reminder to complete and return the questionnaires. To encourage the return of all the questionnaires participants were informed that on top of the participation fee (£15.00) they would receive an incrementally greater payment for each questionnaire returned; £2.50 if they returned one questionnaire, £7.00 if they returned two questionnaires, £12.00 for three, £20.00 for four and £30.00 for all five. Participants were provided with an information sheet to remind them of this incremental payment plan.

Analysis

Prior to analysis, some items were recoded to ensure the same direction of coding and thus facilitate creation and interpretation of composite variables. Composite scores were derived for pack perceptions, pack feelings, feelings about smoking, and response to warnings, by

summing the individual items within each and then rescaling to a five-point scale. Cronbach's alpha was acceptable for each, all above 0.70 with the exception of the overall health warning response for own pack which had an alpha of 0.65, thus supporting the decision to create composite scores for each measure and for each pack type.

Ratings between branded and plain packs were compared and to ensure that packs were compared against equivalent time points, ratings of the plain pack at the first and second measures were compared with ratings of their own pack at the first and second measures, respectively. For each time point, paired t-tests were used to produce mean scores for the plain packs relative to mean scores for their own pack. Given the ordinal nature of the five-point scales, the Wilcoxon Signed Rank test was used to test for significant differences between ratings of plain packs versus participant's own packs at each measure. As the data on avoidant/cessation behaviours were binary (yes/no) the McNemar test was used to test for differences in response between participants' first and second measure on the plain pack and the respective measure on their own pack. The number of avoidant/cessation behaviours associated with each pack was also counted and paired t-tests used to test for differences in the mean number of actions taken with the Kerrods pack versus their own pack at each measure. Composite scores for each pack type were also compared across the two time-points, using Wilcoxon Signed Rank test, to examine whether composite ratings for each pack type was consistent across time. Paired t-tests were used to compare, at each time-point, reported daily consumption when using the Kerrods pack versus their own pack.

Given the paucity of plain packaging research exploring sub-group differences,[2] analyses of the composite scores were also run separately to explore whether the results were consistent by age group (18-24, 25-35), social grade (ABC1, C2DE) and dependence level

(low/medium, high). Social grade was measured via occupation. Dependence level was measured via the Fagerström Test for Nicotine Dependence,[8] with those scoring between 0-5 categorised as having low/medium dependence and those scoring 6-10 high dependence levels.

RESULTS

Of the 301 participants recruited, 54 (17.9%) were non-completers, who failed to participate at all after completing the pre-study questionnaire, 59 (19.6%) were partial completers, who failed to return all the questionnaires or reported using the incorrect pack (e.g. they used their own packs when they were meant to be using the Kerrods packs), and 188 (62.5%) were full completers, who returned all the questionnaires and reported using the correct packs.

Pack Perceptions

On average, participants rated Kerrods negatively on all pack perceptions (not stylish, unfashionable, cheap, uncool, unattractive, poor quality, unappealing), with mean scores ranging from 1.55 to 2.37; lower scores indicating more negative perceptions (see Table 1a). For their own packs the higher mean scores, ranging from 2.91 to 3.69, indicated more positive pack perceptions. For the overall pack perception score (all items combined), participants rated the Kerrods pack more negatively than their own pack, and this did not vary across time for either pack. Results were consistent by age group, social grade and dependence level.

Table 1 here

Pack Feelings

On average, participants reported more negative feelings (embarrassed, ashamed, unaccepted) about using the Kerrods pack, relative to their own pack (see Table 1b). For the Kerrods pack, mean scores ranged from 2.54 to 3.10, whereas mean scores for their own pack ranged from 3.26 to 4.08. For both their own packs and the Kerrods packs, pack feelings were more negative at the second measure. Results were consistent by age group, social grade and dependence level.

Feelings about smoking

Participants reported more negative feelings about smoking from the Kerrods pack (see Table 1c). While participants, on average, rated the smoking experience with their own pack as more 'enjoyable' (mean scores 3.40) and 'satisfying' (mean scores 3.41 to 3.52), for Kerrods the average ratings suggested they were less enjoyable (mean scores 2.73 to 2.90) and satisfying (mean scores 2.83 to 2.99). Participants were more likely to feel 'good' about smoking when using their own packs (mean scores 3.13 to 3.19) than when using the Kerrods pack (mean scores 2.68 to 2.73). Overall ratings for their own packs did not vary across time. For the Kerrods pack, feelings about smoking were rated more negatively at the second measure ($p<0.05$). Results were consistent across age group, social grade and dependence level.

Health warnings

Salience, seriousness and believability

For both pack types, the on-pack health warnings were rated as being noticeable (mean scores 3.41 to 3.44), serious (3.83 to 3.94) and believable (3.91 to 4.10), see Table 2. At the second measure only, warnings on the Kerrods packs were rated as more believable relative to participants' own packs. However, overall ratings of the warnings did not differ between the

packs, and did not vary across time for either pack. Findings were consistent across age, social grade and dependence level.

Table 2 here

Attention and depth of processing

Warnings were rated as being read more closely on the Kerrods pack (mean scores 2.97 to 3.00) than on their own packs (mean scores 2.28 to 2.58), and thought about more on the Kerrods pack (mean scores 3.02 to 3.16) relative to participants' own packs (mean scores 2.52 to 2.80). The overall results were consistent for the age and dependence level sub-groups. However, at the second measure, participants from social grade C2DE did not show any difference, between Kerrods and own pack, in overall warning action response. While there was no difference in the Kerrods measures across time, the ratings were stronger at the second own pack measure compared with the first measure ($p<0.001$).

Avoidant behaviour/Behaviour change

Across the two measures, participants indicated greater occurrence of the following actions when using the Kerrods packs: keeping the pack out of sight; covering the pack; foregoing cigarettes; smoking less around others; thinking about quitting (Table 3). In addition, when using the Kerrods pack, participants were always more likely to stub out a cigarette, although only significantly so at the second measure. On average, participants reported a higher number of behaviour changes or avoidant behaviours when using the Kerrods pack (1.88 and 2.29 at the first and second measures respectively) compared with their own pack (0.84 and 1.12 at the first and second measures respectively). This result was consistent by age, social

grade and dependence level. For each pack type, the number of behaviour changes/avoidant behaviours increased at the second measure ($p<0.001$ for Kerrods and $p<0.01$ for own pack).

At each measure, reported consumption was lower with the Kerrods pack compared with participants' own pack. For the first measure, average daily consumption was 14.9 when using Kerrods and 15.5 when their own pack ($p<0.05$), with daily consumption at the second measure 15.7 when using Kerrods and 16.7 when using their own pack ($p<0.01$). Consumption was higher at the second measure for each pack ($p<0.05$ for Kerrods and $p<0.01$ for own pack).

Table 3 here

Discussion

For young adult female smokers, a key target group for public health, the use of dark brown (plain) cigarette packs in naturalistic settings was associated with more negative perceptions and feelings about the packaging and about smoking than for their own fully branded packs. As with past research in the UK the base colour of the plain packs, a faecal brown, was perceived negatively.[3,7,10-12] Plain packs were also associated with more negative feelings about the pack, in terms of embarrassment and shame, lower ratings of enjoyment and satisfaction of smoking, and increased avoidant (hiding and covering the pack) and cessation related smoking behaviours (stubbing out cigarettes early, forgoing cigarettes and reduced consumption).

Study strengths

The study permits an insight into how smokers respond to plain packaging in natural settings before it has been introduced. It is difficult to envisage an alternative approach which would allow smoking related behaviours to be captured, such as stubbing out cigarettes early, forgoing cigarettes and reduced consumption. Similarly, as the study did not involve forced exposure to packaging it more accurately reflects how smokers respond to the on-pack health warnings, in respect to the attention they are given, how they are perceived and also how deeply they are processed. There were no significant overall differences in ratings of warning salience, seriousness and believability, consistent with a pilot naturalistic study and two recent eye-tracking studies from the UK.[3,13,14] Warning design may, in part, help explain these findings. The positioning of images only on the reverse panel of packaging is inconsistent with the Guidelines for Article 11 of the Framework Convention on Tobacco Control[15] and best international practice - only two countries outside of Europe, Brazil and Venezuela, fail to use pictorial warnings on the pack front - and has been found to reduce warning effectiveness.[9,16] Similarly, lack of rotation is likely to have increased wear-out; although images appeared on the reverse panel of packs in the UK in 2008 to support the warning text, these text has been on packs since 2003. Warnings on plain packs were read more closely and thought about more than on fully branded packs however. That warnings on plain packs were attended to more closely and more deeply processed has not, we believe, been previously reported in the plain packaging literature, and as such advances our understanding of the possible real-world impacts of plain packaging.

It is not only cessation related behaviours such as stubbing out or forgoing cigarettes which can be captured with such an approach, but also behaviours such as smoking less around other people. The UK Department of Health speculate that a potential benefit of plain packaging could be to reduce exposure to second-hand smoke (SHS) from reduced rates of

smoking,[17] which would reduce the high annual direct costs to the NHS incurred by treating illness related to exposure to SHS.[18] That young women reported smoking less around others when using the plain packs suggests that the appearance of the pack, and how it makes some young women feel and think about smoking, may in itself lead to lower exposure to SHS. The Department of Health also suggested that future research consider consumer response to plain packaging across socioeconomic groups,[17] which is somewhat surprisingly lacking in the existing literature.[2] We found no significant differences across income group, or indeed by age or dependence level. While this suggests that plain packaging can help benefit all young women caution should be exercised as the sample size did not permit a more detailed breakdown of socio-economic status or dependence.

Limitations

The study has a number of limitations. The reliance on self-reporting, both in terms of reported behaviour change and the use of the Kerrods packs, is a potential limitation, although given the high level of participant involvement and the nature of the research it is difficult to see a viable alternative. One way would have been to provide participants with their brand of cigarettes already within the plain packs, which would eliminate the need for cigarettes to be transferred from one pack into another, but ethical concerns prohibited us from doing so. While the generic brand name (Kerrods), used to avoid breach of copyright, was intended to be neutral and has previously been found to have no positive or negative associations among smokers,[7] it is nevertheless possible that this may have had an impact on participant's perceptions of plain packaging. The findings cannot be generalised to all young women smokers and provides no insight into the impact of plain packaging on older women smokers, male smokers or non-smokers, although the exclusive focus on young women was taken given high smoking prevalence among this group. It is also possible that participants

may respond differently if only plain packs were available on the legitimate market. Clearly, the true impacts of standardising the appearance of all legitimate cigarette packs on the market remain unclear. Research in Australia can help shed further light on the impacts of plain packaging but given that Australia has stronger tobacco control and lower prevalence of nicotine use than anywhere in the European Union (EU), and as the appearance of plain packaging in Australia would almost certainly differ from that of plain packs in the EU, at least in terms of the size, type and positioning of the on-pack health warnings, then further research in Europe and elsewhere using approaches that more closely approximate what consumers experience when using plain packs in naturalistic settings is required.

Implications for policy makers and clinicians

As a number of governments and executive bodies consider the merits of plain packaging as a policy measure these findings may help inform the decision making process. It is ultimately for policy makers to assess the potential value of plain packaging as part of a comprehensive suite of tobacco control measures aimed at reducing consumption and prevalence, but the collective evidence generally provides support for plain packaging, irrespective of design, location and sample.[2] This study extends this growing body of evidence and is the first to find that smokers were more likely to stub out cigarettes early and reduce consumption when using plain packs. These findings are relevant to the National Institute for Health and Clinical Excellence (NICE) draft guidelines on harm-reduction approaches to smoking, published in October 2012,[19] which positions quitting as the target but points to potential health benefits of consuming fewer cigarettes, or less of each cigarette. Further research is required to provide greater insight into the impacts of plain packaging on smoking behaviour, and more broadly what the health benefits, if any, of reduced consumption and intake are,[19] but these findings contribute to the harm-reduction debate and suggest that plain packaging may have a role to

play in this proposed harm-reduction approach. The study also points to opportunities for clinicians. While plain packaging was found to increase thoughts of quitting, even when using their own packs between a quarter and a third young women reported thinking about and wanting to quit. Smoking rates are higher among young women than for older women and for males of any age,[5] and prevalence among 20-24 year olds has declined at a slower rate than for any other age group in the last quarter of a century, from 35% in 1984 to 30% in 2010.[5] As such, the desire to change among a significant percentage of such a key target group suggests that this group may benefit from intervention by clinicians or health care professionals.

Notes

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Competing interests: None.

Ethical approval: The study obtained ethics approval from the ethics committee of the Marketing Department at the University of Stirling. Participants provided informed consent before taking part.

Data sharing: No additional data available.

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Table 1. Mean ratings on response to Kerrods pack v Own pack for pack perceptions, pack feelings and feelings about smoking

	1st Measure		2nd Measure	
	Kerrods	**Own**	**Kerrods**	**Own**
	mean	mean	mean	mean
	sd	*sd*	*sd*	*sd*
a) Pack Perceptions (7 items)				
Style	1.55	3.16***	1.62	3.23***
not stylish(1)/stylish(5)	*0.88*	*0.99*	*0.90*	*0.98*
Fashion	2.30	3.07***	1.88	3.08***
unfashionable(1)/fashionable(5)	*1.53*	*1.03*	*1.22*	*1.02*
Cheap	1.74	3.30***	1.90	3.37***
cheap(1)/expensive(5)	*0.99*	*1.08*	*1.02*	*1.03*
Cool	1.74	2.95***	1.76	2.91***
uncool(1)/cool(5)	*0.87*	*0.99*	*0.89*	*0.94*
Attractive	1.78	3.03***	1.72	3.07***
unattractive(1)/attractive(5)	*1.15*	*1.14*	*0.99*	*1.05*
Quality	2.37	3.69***	2.26	3.64***
poor quality(1)/good quality(5)	*1.16*	*0.95*	*1.11*	*0.93*
Appealing	1.81	3.19***	1.85	3.16***
unappealing(1)/appealing(5)	*1.06*	*1.08*	*1.04*	*0.97*
Overall Pack Perceptions				
Composite score	1.90	3.19***	1.85	3.21***
Low score = negative				

perceptions / High score = positive perceptions				
b) Pack Feelings (3 items)				
Embarrassment	2.70	4.08***	2.54	3.84***
embarrassed(1)/not embarrassed(5)	*1.29*	*1.14*	*1.25*	*1.04*
Ashamed	3.10	4.02***	2.71	3.72***
ashamed(1)/not ashamed(5)	*1.26*	*1.12*	*1.18*	*1.08*
Acceptance	2.69	3.37***	2.55	3.26***
unaccepted(1)/accepted(5)	*1.02*	*1.07*	*0.95*	*0.99*
Overall Pack Feelings				
Composite score	2.84	3.82***	2.60	3.62***
Low score = negative perceptions / High score = positive perceptions				
c) Feelings about smoking (3 items)				
Enjoyment	2.90	3.40***	2.73	3.40***
enjoyable(1)/ enjoyable(5)	*0.97*	*0.95*	*0.97*	*0.96*
Satisfaction	2.99	3.52***	2.83	3.41***
not satisfying(1)/satisfying(5)	*0.99*	*0.93*	*1.00*	*0.98*

Good	2.73	3.13***	2.68	3.19***
bad(1)/good(5)	*0.87*	*0.93*	*0.95*	*0.98*
Overall Feelings Smoking				
Composite score	2.88	3.36***	2.75	3.34***
Low score = negative perceptions / High score = positive perceptions				

*** p<0.001; ** p<0.01; * p<0.05

Table 2. Mean ratings on response to Kerrods pack v Own pack for health warning salience and credibility, and attention and depth of processing

Health warnings (salience and credibility)				
Noticing	3.44	3.43	3.41	3.25
hardly noticeable(1)/very(5)	*1.39*	*1.33*	*1.40*	*1.29*
Seriousness	3.94	3.83	3.84	3.89
not serious(1)/ serious(5)	*1.12*	*1.12*	*1.26*	*1.04*
Believability	4.10	4.08	4.09	3.91*
not believable(1)/believable(5)	*1.09*	*0.98*	*1.09*	*1.06*
Overall Warning Response				
Composite score	3.92	3.77	3.77	3.67
Low score = little, no impact / High score = high impact				
Health warnings (attention and depth of processing)				
Attention	3.00	2.28***	2.97	2.58***
not looking closely(1)/looking closely(5)	*1.47*	*1.34*	*1.51*	*1.35*
Thinking about warnings	3.02	2.52***	3.16	2.80***
not think about what they are	*1.41*	*1.36*	*1.47*	*1.34*

telling you(1)/thinking about what they are telling you(5)				
Overall Warning Action Response				
Composite score Low score = little or no action / high score = high action	3.00	2.39***	3.06	2.69***

*** p<0.001; ** p<0.01; * p<0.05

Table 3: Proportion of participants reporting avoidant behaviour or behaviour change as a result of the pack

	1st Measure		2nd Measure	
Behaviour change / avoidant behaviour	**Kerrods %**	**Own %**	**Kerrods %**	**Own %**
Stub out cigarette	10	5	17	10*
Forego a cigarette	13	4**	15	10*
Keep pack out of sight	53	11***	55	10***
Cover pack	10	2***	10	2***
Smoke less around others	21	3***	39	16***
Think about quitting	39	26***	46	34***
Want to quit	33	25	37	32
Mean number of actions	1.88	0.84***	2.29	1.12***
sd	*1.80*	*1.36*	*2.16*	*1.61*

*** p<0.001; ** p<0.01; * p<0.05

Figure 1: Brown 'plain' packs and health warnings used
791x315mm (72 x 72 DPI)

Young adult women smokers' response to using plain cigarette packaging: A naturalistic approach

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Title: Young adult women smokers' response to using plain cigarette packaging: A naturalistic approach

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Young adult women smokers' response to using plain cigarette packaging: A naturalistic approach

Abstract

Objectives: To explore young adult women smokers' cognitive and emotional response to using dark brown 'plain' cigarette packs in natural settings and whether plain packaging is associated with any short-term change in smoking behaviour.

Design: A naturalistic approach. Participants used plain cigarette packs provided to them for one week and their own fully branded packs for one week, but otherwise smoked and socialised as normal. Participants completed questionnaires twice a week.

Setting: The six most populated cities and towns in Scotland.

Participants: 301 young women smokers were recruited, with a final sample of 187 (62.1%). To meet the inclusion criteria women had to be between the ages of 18 and 35, daily cigarette smokers, and provide a breath sample to confirm smoking status.

Primary and secondary outcome measures: Pack perceptions and feelings, feelings about smoking, salience and perceptions of health warnings, and avoidant and cessation behaviours.

Results: In comparison to branded packaging, plain packaging was associated with more negative perceptions and feelings about the pack and about smoking ($p<0.001$). No significant overall differences in salience, seriousness or believability of health warnings were found between the pack types, but participants reported looking more closely at the warnings on plain packs and also thinking more about what the warnings were telling them ($p<0.001$). Participants reported being more likely to engage in avoidant behaviours, such as hiding or covering the pack ($p<0.001$), and cessation behaviours, such as foregoing cigarettes ($p<0.05$), smoking less around others ($p<0.001$), thinking about quitting ($p<0.001$) and

reduced consumption ($p<0.05$), when using the plain packs. Results did not differ by dependence level or socio-economic status.

Conclusions: No research design can capture the true impacts of plain packaging prior to its introduction, but this study suggests that plain packaging may help to reduce cigarette consumption and encourage cessation in the short-term.

ARTICLE SUMMARY

Article focus

- How young adult women smokers respond to using plain cigarette packaging, in comparison to fully branded cigarette packaging. We explored the impact of plain packaging on short-term smoking related behaviour

Key messages

- Plain packaging was associated with lower ratings of enjoyment and satisfaction of smoking in comparison with fully branded packaging
- Participants reported looking more closely at the health warnings on plain packs and also thinking more about what the warnings were telling them
- Plain packaging, in comparison with fully branded packaging, was associated with forgoing cigarettes, smoking less around others, increased thoughts of cessation and reduced consumption

Strengths and limitations

- The main strength of the study is that it allows an insight into how smokers respond to plain packaging before it has been introduced
- The main limitations are the novelty of plain packaging and reliance on self-reported smoking behaviour

Introduction

At the annual meeting of the Canadian Medical Association in 1986 it was proposed that all tobacco products should come in 'plain' brown standardised packs in order to minimise their attractiveness.[1] Approximately a quarter of a century on and plain tobacco packaging was fully implemented in Australia, for the first time, in December 2012. Prior to this, consultations on plain packaging ended in New Zealand in October and in the United Kingdom (UK) in August 2012. What the actual impacts of plain packaging will be, if any, remains to be seen however. A recent systematic review of the plain packaging literature, with 37 included studies, suggests that plain packaging may have a number of potential public health benefits, including: 1) reducing the appeal of the packaging and of cigarettes, 2) increasing the salience, believability and seriousness of the health warnings, although this was influenced by the type (pictorial or text), size and strength of the warnings used, and 3) increasing perceptions of harm, although this was dependent upon the colour of the plain pack, with darker coloured plain packs typically perceived as more harmful, and lighter coloured plain packs less harmful, than fully branded cigarette packs.[2]

One of the longstanding criticisms of the literature is that existing research typically involves gauging consumer response to plain packaging following brief exposure in a controlled environment and, as a result, fails to capture how consumers would react to and use plain packs over time in naturalistic settings. To date only one study has attempted a real world test of plain packaging. This study used a design which involved young adult men and women smokers in Glasgow (Scotland) transferring cigarettes from their own packs into plain packs provided and using these packs instead of their own packs for two weeks, and their own packs for two weeks.[3] Participants completed a questionnaire twice a week throughout the study to allow for comparisons to be made between the plain packs and their own packs. Pack

perceptions and feelings, and feelings about smoking, were more negative for plain packs, and participants were more likely to report avoidant behaviours (e.g. covering the pack) and cessation related behaviours (e.g. thinking about quitting) when using the plain packs. Post-study interviews were conducted with a sub-sample of participants (N=18) to explore their experiences of using the brown (plain) packs. In the post-study interviews women were more likely than men to report avoidant behaviour when using the plain packs, and only women reported reduced consumption when using plain packs. The pilot nature of this study, recruitment within a single city, low retention rate (34%) and relatively small final sample (N=48) means that further research is needed to test these findings.

We aimed to extend this previous study by following the same approach but with a larger and more nationally distributed sample of young adult women smokers, who appeared to be more influenced by pack design than men in the pilot study. While high rates of smoking among women tend to be the norm in most of Europe, with a prevalence of 20% or more in all but four of EU member countries (Italy, Portugal, Slovakia and Sweden), this contrasts sharply with much of the rest of the world.[4] Prevalence of smoking among women is less than 20% in the Middle East, North and Central America and Asia (excluding Lebanon and Nepal), and less than 10% in Africa, where figures are available.[4] In the UK smoking prevalence among women is currently 20% and in long-term decline, but prevalence is declining at a slower rate than for men and remains particularly high for young adult women, with 25% of 25-34 year old women and 30% of 20-24 year old women smokers.[5]

The high smoking rates among young women in the UK represents a significant future burden of both mortality and morbidity should this trend not be reversed. With a growing number of slim, elegant cigarette packs targeted at young women being brought to market in

the UK and elsewhere within the last five years, and given that the aesthetic appeal of cigarette packaging appears to be more important for young women than for young men,[3,6,7,8] plain packaging may have a role to play in reducing the high rates of smoking among young women. This study explored young women's experiences of using plain cigarette packaging as they went about their everyday lives.

Methods

Design and sample

Between June 2011 and March 2012 young adult women smokers (N=301) were recruited from eight postcode sectors from within the six most populated towns and cities in Scotland (Glasgow, Edinburgh, Aberdeen, Dundee, Paisley, East Kilbride) using random location quota sampling. The postcode sectors were randomly selected, stratified by DEPCAT score, which is a measure of multiple deprivation, to ensure coverage of a range of socio-economic backgrounds. Within each postcode sector, market recruiters were instructed to recruit either six or seven participants, using the door knock method, according to quota controls on age (18-24 / 25-35) and daily consumption (light, moderate smokers were defined as those smoking 14 cigarettes a day or less / heavy smokers as those smoking 15 cigarettes a day or more).

The market recruiters, who were briefed about the study protocol but blind to the purpose of the study, informed all potential participants that the study was concerned with smokers' opinions of cigarette packaging. If individuals were willing to participate and available for the duration of the study, they were asked to complete a recruitment questionnaire, which included the Fagerström Test for Nicotine Dependence[9] and questions regarding brand variant smoked, risk perceptions and cessation behaviour (e.g. motivation to quit, attempts to

quit). To ensure only smokers were recruited participants were asked to provide a breath sample using a piCO+™ Carbon Monoxide monitor (Bedfont Scientific) and also an empty cigarette pack; in the four instances where a participant only had a full pack, recruiters took a photo of their pack and texted this to a member of the research team. Ethics approval was obtained from the ethics committee of the Marketing Department at the University of Stirling. Participants provided informed consent before taking part.

Materials and procedure

Participants were informed about the study protocol by market recruiters and, if they gave consent, were provided with a 'completion' pack. Each completion pack included seven brown (plain) cigarette packs. These brown packs were only suitable for participants who smoked King Size cigarettes, as was the case in a pilot study using the same approach.[3] As nine of the top ten selling cigarette brand variants in the UK come in King Size packs most smokers would have been eligible for study inclusion. However, as all of the top 25 selling cigarette brand variants in the UK come in either King Size or Superkings packs,[10] which are slightly bigger than the standard King Size pack, market recruiters were given a box of Superkings plain packs and instructed to use these where appropriate. This involved replacing the seven King Size brown packs within the completion pack with seven Superkings brown packs if an individual smoked a Superkings brand or other longer cigarettes, such as Slims or Superslims. The plain packs were otherwise identical, with a fictitious brand name Kerrods, to prevent copyright breach, and all relevant legal markings and a barcode. The completion packs also included five numbered questionnaires, labelled by day and date, and a timetable explaining when to use their own packs and the Kerrods packs and when to complete and return each of the five questionnaires.

The study, which always started on a Monday, ran for two weeks. Participants were instructed to transfer cigarettes from their own packs into the Kerrods packs supplied to them and use these for one week of the study, and their own packs for the other week of the study. Ordering was randomised so that half the sample used the plain pack in the first week of the study and half in the second week. Participants were instructed to retain and re-use the Kerrods packs if they smoked more than 20 cigarettes in a day. In the UK cigarette packs contain one of two text health warnings on the front ('Smoking kills' or 'Smoking seriously harms you and others around you') and one of fourteen 'pictorial' warnings on the reverse panel, although three are in fact text warnings as they do not display a picture, photo, pictogram or symbol. All Kerrods packs had the same warning on the pack front (Smoking kills) and one of three 'pictorial' warnings on the reverse panel showing either; a set of healthy and diseased lungs, smoke in a child's face or a text warning about seeking help (see Figure 1). Past research has found these three warnings to have high (lungs), medium (smoke in child's face) and low salience (seeking help) among smokers.[11] Each completion pack contained at least two packs with each of the three warnings. We included packs with different health warnings to reflect the types of warnings that smokers receive on packs and prevent all packs featuring only warnings found to have high or low salience, as this could potentially influence response to the warning items.

Figure 1 here

Participants were instructed to complete five questionnaires during the two weeks of the study. Questionnaires 1 and 2 were to be completed and returned, via pre-addressed envelopes or by email, on the Thursday and Sunday respectively of the first week. Questionnaires 3 and 4 were to be completed and returned on the Thursday and Sunday

respectively in the second week. The first four questionnaires, which were identical (see Appendix 1), resulted in two questionnaires relating to their experience of the plain packs and two relating to their own pack. Questionnaire 5 included the same questions as the pre-study questionnaire about risk perceptions and cessation behaviour, and was to be completed and returned on the same day as questionnaire 4 to reduce participant burden. This is not included in this analysis.

Although the day and date each questionnaire was to be completed and returned was highlighted on the front cover and specified in the timetable, in an attempt to increase study compliance the research team sent a text message to each participant the day before study onset, always a Sunday. The text reminded participants: 1) that the study would start the next day, 2) what packs they were to use for the coming week, and 3) to complete questionnaire 1 the following Thursday (the day and date was given for clarity). A second text message was sent the following Sunday to remind participants to complete and return questionnaire 2 that day, and on which packs to use for the following week. A third and final text was sent the subsequent Sunday, reminding participants to complete and return questionnaires 4 and 5 that day. Participants were also sent a reminder letter during the first week of the study and an email was sent every Thursday and Sunday morning to participants who had provided an email address as an additional reminder to complete and return the questionnaires. To encourage the return of all the questionnaires participants were informed that on top of the participation fee (£15.00) they would receive an incrementally greater payment for each questionnaire returned; £2.50 if they returned one questionnaire, £7.00 if they returned two questionnaires, £12.00 for three, £20.00 for four and £30.00 for all five. Participants were provided with an information sheet to remind them of this incremental payment plan.

Analysis

Prior to analysis, some items were recoded to ensure the same direction of coding and thus facilitate creation and interpretation of composite variables. Composite scores were derived for pack perceptions, pack feelings, feelings about smoking, and response to warnings, by summing the individual items within each and then rescaling to a five-point scale. Cronbach's alpha was acceptable for each, all above 0.70 with the exception of the overall health warning response for own pack which had an alpha of 0.65, thus supporting the decision to create composite scores for each measure and for each pack type.

Ratings between fully branded and Kerrods plain packs were compared. Ratings collected on the Thursday questionnaires are referred to as 'midweek' and those collected on the following Sunday referred to as 'weekend'. For each analysis, midweek ratings of the Kerrods pack were compared with midweek ratings of their own pack and weekend ratings of the Kerrods pack were compared with weekend ratings of their own pack. Paired t-tests were used to produce mean scores for the Kerrods pack relative to mean scores for their own pack. Given the ordinal nature of the five-point scales, the Wilcoxon Signed Rank test was used to test for differences between ratings of the Kerrods pack versus participant's own packs. As the data on avoidant/cessation behaviours were binary (yes/no) the McNemar test was used to test for differences in response to the Kerrods pack versus their own pack. The number of avoidant/cessation behaviours associated with each pack was also counted and paired t-tests were used to test for differences in the mean number of actions taken with the Kerrods pack versus their own pack. Similarly, paired t-tests were used to test for differences in mean reported daily consumption when using the Kerrods pack versus their own pack. Comparisons across time were also made by comparing the midweek composite scores for the Kerrods pack versus the weekend composite scores for the Kerrods pack and comparing

the midweek composite scores for their own pack versus the weekend composite scores for their own pack. The Wilcoxon Signed Rank test was used to test for differences, across time, in the composite scores. Paired t-tests were used to test for differences between midweek and weekend reports on the number of avoidant/cessation behaviours and reported daily consumption with each pack

Given the paucity of plain packaging research exploring sub-group differences,[2] analyses of the composite scores were also run separately to explore whether the results were consistent by age group (18-24, 25-35), social grade (ABC1, C2DE) and dependence level (light, moderate/ high). Social grade, based on occupation, was classified in accordance with the six groups (A – upper middle class; B – middle class; C1 – lower middle class; C2 – skilled working class; D – working class and E – those at lowest level of subsistence) used by the British National Readership Survey. These six groups were combined to form two groups to enable broad comparison between middle class (ABC1) and working class (C2DE) participants. Dependence level was measured via the Fagerström Test for Nicotine Dependence,[9] with those scoring between 0-5 categorised as having light/moderate dependence and those scoring 6-10 high dependence levels.

RESULTS

Of the 301 participants recruited, 54 (17.9%) were non-completers, who failed to participate at all after completing the pre-study questionnaire, 60 (19.9%) were partial completers, who failed to return all the questionnaires or reported using the incorrect pack (e.g. they used their own packs when they were meant to be using the Kerrods packs), and 187 (62.1%) were full completers, who returned all the questionnaires and reported using the correct packs. Results presented in this paper are based on the full completers. The average age of the full

completers was 27.14 years (sd 5.63); 84 (44.9%) were from social grade ABC1 and 103 (55.1%) from social grade C2DE; 96 (51.3%) had light/moderate dependence and 91 (48.7%) high dependence; average daily cigarette consumption was 17.28 (sd 7.19); 33 (17.6%) had given up for one day or more in the previous month and 129 (69.0%) indicated that they would like to or really wanted to give up smoking. There was no significant difference in terms of age, dependence level or motivation to quit between those included in the analyses and those excluded (non-completers and partial completers). However, participants from social group ABC1 were more likely to complete the study fully (71.2% of ABC1s were full completers v 56.6% of C2DEs, $p<0.05$) as were participants with a past month quit attempt of one day or more (78.6% of those with a past month quit attempt completed the study fully v 59.7% of those with no past month quit attempt, $p<0.05$).

Pack Perceptions

On average, participants rated Kerrods negatively on all pack perceptions (not stylish, unfashionable, cheap, uncool, unattractive, poor quality, unappealing), with mean scores ranging from 1.55 to 2.37; lower scores indicating more negative perceptions (see Table 1a). For their own packs the higher mean scores, ranging from 2.91 to 3.69, indicated more positive pack perceptions. For the overall pack perception score (all items combined), participants rated the Kerrods pack more negatively than their own pack, and this did not vary across time for either pack. Results were consistent by age group, social grade and dependence level.

Table 1 here

Pack Feelings

On average, participants reported more negative feelings (embarrassed, ashamed, unaccepted) about using the Kerrods pack, relative to their own pack (see Table 1b). For the Kerrods pack, mean scores ranged from 2.54 to 3.10, whereas mean scores for their own pack ranged from 3.26 to 4.08. For both their own packs and the Kerrods pack, overall pack feelings were rated more negatively at the weekend compared with midweek ($p<0.001$). Results were consistent by age group, social grade and dependence level.

Feelings about smoking

Participants reported more negative feelings about smoking from the Kerrods pack, in terms of enjoyment, satisfaction and feeling good, relative to their own pack (see Table 1c). For the Kerrods pack, mean scores ranged from 2.68 to 2.99, while mean scores for their own packs ranged from 3.13 to 3.52. Overall ratings for their own packs did not vary across time. For the Kerrods pack, overall feelings about smoking were rated more negatively at the weekend compared with midweek ($p<0.05$). Results were consistent across age group, social grade and dependence level.

Health warnings

Salience, seriousness and believability

For both pack types, the on-pack health warnings were rated as being noticeable (mean scores 3.41 to 3.44), serious (3.83 to 3.94) and believable (3.91 to 4.10), see Table 2. At the weekend only, warnings on the Kerrods pack were rated as more believable relative to participants' own packs. However, overall ratings of the warnings did not differ between the packs, and did not vary across time for either pack. Findings were consistent across age, social grade and dependence level.

Table 2 here

Attention and depth of processing

Warnings were rated as being read more closely on the Kerrods pack (mean scores 2.97 to 3.00) than on their own packs (mean scores 2.28 to 2.58), and thought about more on the Kerrods pack (mean scores 3.02 to 3.16) relative to participants' own packs (mean scores 2.52 to 2.80). The overall results were consistent for the age and dependence level sub-groups. However, at the weekend, participants from social grade C2DE did not show any significant difference, between Kerrods and own pack, in overall warning action response. While there was no difference in the overall Kerrods ratings across time, the own pack ratings were stronger at the weekend compared with midweek ($p<0.001$).

Avoidant behaviour/Behaviour change

Participants always indicated greater occurrence of the following actions when using the Kerrods packs: keeping the pack out of sight; covering the pack; foregoing cigarettes; smoking less around others; thinking about quitting (Table 3). In addition, when using the Kerrods pack, participants were more likely to stub out a cigarette, although only significantly so at the weekend. They were also more likely to want to quit smoking, when using the Kerrods pack, though only significantly so at midweek. On average, participants reported a higher number of behaviour changes or avoidant behaviours when using the Kerrods pack (1.88 and 2.29 midweek and weekend respectively) compared with their own pack (0.84 and 1.12 midweek and weekend respectively). This result was consistent by age, social grade and dependence level. For each pack type, the number of behaviour changes/avoidant behaviours increased at the weekend ($p<0.001$ for Kerrods and $p<0.01$ for own pack).

Table 3 here

Reported consumption was always lower with the Kerrods pack compared with participants' own pack. Midweek average daily consumption was 14.9 when using Kerrods and 15.5 when using their own pack ($p<0.05$), with weekend average daily consumption 15.7 when using Kerrods and 16.7 when using their own pack ($p<0.01$). The pattern of lower consumption, when using the Kerrods pack versus their own pack, was observed within each of the age, social grade and dependence level sub-groups, but did not always reach significance. Consumption was higher at the weekend for each pack ($p<0.05$ for Kerrods and $p<0.01$ for own pack).

Discussion

For young adult women smokers, a key target group for public health, the use of dark brown (plain) cigarette packs in naturalistic settings was associated with more negative perceptions and feelings about the packaging and about smoking than for their own fully branded packs. As with past research in the UK the base colour of the plain packs, a faecal brown, was perceived negatively.[3,7,12,13] Plain packs were also associated with more negative feelings about the pack, in terms of embarrassment and shame, lower ratings of enjoyment and satisfaction of smoking, and increased avoidant (hiding and covering the pack) and cessation related smoking behaviours (stubbing out cigarettes early, forgoing cigarettes and reduced consumption). These findings closely reflect those of a pilot study using the same approach.[3] The key differences to emerge between the studies were that in the pilot study stubbing out cigarettes early when using the plain packs was never significant and forgoing cigarettes

when using plain packs was not always significant. As level of consumption was not measured in the pilot study questionnaires no comparisons can be made.

Study strengths

The study permits an insight into how smokers respond to plain packaging in natural settings before it has been introduced. It is difficult to envisage an alternative approach which would allow smoking related behaviours to be captured, such as stubbing out cigarettes early, forgoing cigarettes and reduced consumption. Similarly, as the study did not involve forced exposure to packaging it more accurately reflects how smokers respond to the on-pack health warnings, in respect to the attention they are given, how they are perceived and also how deeply they are processed. There were no significant overall differences in ratings of warning salience, seriousness and believability, consistent with a pilot naturalistic study and two recent eye-tracking studies from the UK.[3,14,15] Warning design may, in part, help explain these findings. The positioning of images only on the reverse panel of packaging is inconsistent with the Guidelines for Article 11 of the Framework Convention on Tobacco Control[16] and best international practice. Indeed, very few countries outside of Europe that require pictorial warnings to be displayed on cigarette packs, such as Argentina and Venezuela, fail to use pictorial warnings on the pack front. Including pictorial warnings only on the reverse panel of packaging has been found to reduce warning effectiveness.[9] Similarly, lack of rotation is likely to have increased wear-out; although images appeared on the reverse panel of packs in the UK in 2008 to support the warning text, the text has been on packs since 2003. Warnings on plain packs were read more closely and thought about more than on fully branded packs however. That warnings on plain packs were attended to more closely and more deeply processed, which was not assessed in the pilot study, advances our understanding of the possible real-world impacts of plain packaging.

It is not only cessation related behaviours such as stubbing out or forgoing cigarettes which can be captured with such an approach, but also behaviours such as smoking less around other people. The UK Department of Health speculate that a potential benefit of plain packaging could be to reduce exposure to second-hand smoke (SHS) from reduced rates of smoking,[17] which would reduce the high annual direct costs to the NHS incurred by treating illness related to exposure to SHS.[18] That young women reported smoking less around others when using the plain packs suggests that the appearance of the pack, and how it makes some young women feel and think about smoking, may in itself lead to lower exposure to SHS. The Department of Health also suggested that future research consider consumer response to plain packaging across socioeconomic groups,[17] which is somewhat surprisingly lacking in the existing literature.[2] We found no significant differences across income group, or indeed by age or dependence level. While this suggests that plain packaging could potentially help benefit all young women, caution should be exercised as the sample size did not permit a more detailed breakdown of socio-economic status or dependence.

Limitations

The study has a number of limitations. The reliance on self-reporting, both in terms of reported behaviour change and the use of the Kerrods packs, is a potential limitation. Given the high level of participant involvement and the nature of the research it is difficult to see a viable alternative. One way would have been to provide participants with their brand of cigarettes already within the plain packs, which would eliminate the need for cigarettes to be transferred from one pack into another, but ethical concerns prohibited us from doing so. While the generic brand name (Kerrods), used to avoid breach of copyright, was intended to be neutral and has previously been found to have no positive or negative associations among

smokers,[7] it is nevertheless possible that this may have had an impact on participant's perceptions of plain packaging. The findings cannot be generalised to all young women smokers and provides no insight into the impact of plain packaging on older women smokers, male smokers or non-smokers, although the exclusive focus on young women was taken given high smoking prevalence among this group. It is also possible that participants may respond differently if only plain packs were available on the legitimate market. Clearly, the true impacts of standardising the appearance of all legitimate cigarette packs on the market remain unclear. Research in Australia can help shed further light on the impacts of plain packaging. However, given that Australia has strong tobacco control, the largest on-pack warnings in the world and low prevalence of nicotine use, further research in Europe and elsewhere using approaches that more closely approximate what consumers experience when using plain packs in naturalistic settings is required.

Implications for policy makers and clinicians

As a number of governments consider the merits of plain packaging as a policy measure these findings may help inform the decision making process. It is ultimately for policy makers to assess the potential value of plain packaging as part of a comprehensive suite of tobacco control measures aimed at reducing consumption and prevalence, but the collective evidence generally provides support for plain packaging, irrespective of design, location and sample.[2] This study extends this growing body of evidence and is the first to find that smokers were more likely to stub out cigarettes early and reduce consumption when using plain packs. These findings are relevant to the National Institute for Health and Clinical Excellence (NICE) draft guidelines on harm-reduction approaches to smoking, published in October 2012,[19] which positions quitting as the target but points to potential health benefits of consuming fewer cigarettes, or less of each cigarette. Further research that provides greater

insight into the impacts of plain packaging on smoking behaviour, and more broadly what the health benefits, if any, of reduced consumption and intake are,[19] would be of value. However, the present findings contribute to the harm-reduction debate and suggest that plain packaging may have a role to play in this proposed harm-reduction approach.

The study also points to opportunities for clinicians. While plain packaging was found to increase thoughts of quitting, even when using their own packs between a quarter and a third of young women reported thinking about and wanting to quit. Smoking rates are higher among young women than for older women and for males of any age,[5] and prevalence among 20-24 year olds has declined at a slower rate than for any other age group in the last quarter of a century, from 35% in 1984 to 30% in 2010.[5] As such, the desire to change among a significant percentage of such a key target group suggests that young women may benefit from intervention by clinicians or health care professionals.

Notes

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Contributors: CM designed data collection tools, monitored data collection, cleaned the data, and drafted and revised the paper. CM is guarantor. AMM designed data collection tools, analysed the data, and drafted and revised the paper.

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Competing interests: None.

Ethical approval: The study obtained ethics approval from the ethics committee of the Marketing Department at the University of Stirling. Participants provided informed consent before taking part.

Data sharing: No additional data available.

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Table 1. Mean ratings on response to Kerrods pack v Own pack for pack perceptions, pack feelings and feelings about smoking

	Midweek		Weekend	
	Kerrods	**Own**	**Kerrods**	**Own**
	mean	mean	mean	mean
	sd	*sd*	*sd*	*sd*
a) Pack Perceptions (7 items)				
Style	1.55	3.16***	1.62	3.23***
not stylish(1)/stylish(5)	*0.88*	*0.99*	*0.90*	*0.98*
Fashion	2.30	3.07***	1.88	3.08***
unfashionable(1)/fashionable(5)	*1.53*	*1.03*	*1.22*	*1.02*
Cheap	1.74	3.30***	1.90	3.37***
cheap(1)/expensive(5)	*0.99*	*1.08*	*1.02*	*1.03*
Cool	1.74	2.95***	1.76	2.91***
uncool(1)/cool(5)	*0.87*	*0.99*	*0.89*	*0.94*
Attractive	1.78	3.03***	1.72	3.07***
unattractive(1)/attractive(5)	*1.15*	*1.14*	*0.99*	*1.05*
Quality	2.37	3.69***	2.26	3.64***
poor quality(1)/good quality(5)	*1.16*	*0.95*	*1.11*	*0.93*
Appealing	1.81	3.19***	1.85	3.16***
unappealing(1)/appealing(5)	*1.06*	*1.08*	*1.04*	*0.97*
Overall Pack Perceptions				
Composite score	1.90	3.19***	1.85	3.21***

Low score = negative perceptions / High score = positive perceptions	*0.72*	*0.07*	*0.73*	*0.76*
b) Pack Feelings (3 items)				
Embarrassment	2.70	4.08***	2.54	3.84***
embarrassed(1)/not embarrassed(5)	*1.29*	*1.14*	*1.25*	*1.04*
Ashamed	3.10	4.02***	2.71	3.72***
ashamed(1)/not ashamed(5)	*1.26*	*1.12*	*1.18*	*1.08*
Acceptance	2.69	3.37***	2.55	3.26***
unaccepted(1)/accepted(5)	*1.02*	*1.07*	*0.95*	*0.99*
Overall Pack Feelings				
Composite score Low score = negative perceptions / High score = positive perceptions	2.84 *1.03*	3.82*** *0.92*	2.60 *0.99*	3.62*** *0.86*
c) Feelings about smoking (3 items)				
Enjoyment	2.90	3.40***	2.73	3.40***
enjoyable(1)/ enjoyable(5)	*0.97*	*0.95*	*0.97*	*0.96*
Satisfaction	2.99	3.52***	2.83	3.41***
not satisfying(1)/satisfying(5)	*0.99*	*0.93*	*1.00*	*0.98*

Good	2.73	3.13***	2.68	3.19***
bad(1)/good(5)	*0.87*	*0.93*	*0.95*	*0.98*
Overall Feelings Smoking				
Composite score	2.88	3.36***	2.75	3.34***
Low score = negative perceptions / High score = positive perceptions	*0.82*	*0.83*	*0.89*	*0.87*

*** p<0.001; ** p<0.01; * p<0.05

Table 2. Mean ratings on response to Kerrods pack v Own pack for health warning salience and credibility, and attention and depth of processing

	Midweek		Weekend	
	Kerrods	**Own**	**Kerrods**	**Own**
Health warnings	mean	mean	mean	mean
(salience and credibility)	*sd*	*sd*	*sd*	*sd*
Noticing	3.44	3.43	3.41	3.25
hardly noticeable(1)/very(5)	*1.39*	*1.33*	*1.40*	*1.29*
Seriousness	3.94	3.83	3.84	3.89
not serious(1)/ serious(5)	*1.12*	*1.12*	*1.26*	*1.04*
Believability	4.10	4.08	4.09	3.91*
Not believable(1)/				
believable(5)	*1.09*	*0.98*	*1.09*	*1.06*
Overall Warning Response				
Composite score	3.92	3.77	3.77	3.67
Low score = little, no impact /				
High score = high impact	*0.97*	*0.93*	*1.01*	*0.88*
Health warnings (attention				
and depth of processing)				
Attention	3.00	2.28***	2.97	2.58***
not looking				
closely(1)/looking closely(5)	*1.47*	*1.34*	*1.51*	*1.35*

Thinking about warnings	3.02	2.52***	3.16	2.80***
not think about what they are telling you(1)/thinking about what they are telling you(5)	*1.41*	*1.36*	*1.47*	*1.34*
Overall Warning Action Response				
Composite score Low score = little or no action / high score = high action	3.00	2.39***	3.06	2.69***
	1.38	*1.26*	*1.42*	*1.27*

*** p<0.001; ** p<0.01; * p<0.05

Table 3: Proportion of participants reporting avoidant behaviour or behaviour change as a result of the pack

	Midweek		Weekend	
Behaviour change / avoidant behaviour	**Kerrods %**	**Own %**	**Kerrods %**	**Own %**
Stub out cigarette	10	5	17	10*
Forego a cigarette	13	4**	15	8*
Keep pack out of sight	54	11***	55	10***
Cover pack	10	2***	21	3***
Smoke less around others	33	11***	39	16***
Think about quitting	39	26***	46	34***
Want to quit	33	25*	37	32
Mean number of actions	1.88	0.84***	2.29	1.12***
sd	*1.80*	*1.36*	*2.16*	*1.61*

*** p<0.001; ** p<0.01; * p<0.05

Figure 1: Brown 'plain' packs and health warnings used on the front and back of packs 245x90mm (300 x 300 DPI)

Title: Young adult women smokers' response to using plain cigarette packaging: A naturalistic approach

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Young adult women smokers' response to using plain cigarette packaging: A naturalistic approach

Abstract

Objectives: To explore young adult women smokers' cognitive and emotional response to using dark brown 'plain' cigarette packs in natural settings and whether plain packaging is associated with any short-term change in smoking behaviour.

Design: A naturalistic approach. Participants used plain cigarette packs provided to them for one week and their own fully branded packs for one week, but otherwise smoked and socialised as normal. Participants completed questionnaires twice a week.

Setting: The six ~~largest~~ most populated cities and towns in Scotland.

Participants: 301 young women smokers were recruited, with a final sample of ~~188~~ 187 (62.1~~5~~%). To meet the inclusion criteria women had to be between the ages of 18 and 35, daily cigarette smokers, and provide a breath sample to confirm smoking status.

Primary and secondary outcome measures: Pack perceptions and feelings, feelings about smoking, salience and perceptions of health warnings, and avoidant and cessation behaviours.

Results: In comparison to branded packaging, plain packaging was associated with more negative perceptions and feelings about the pack and about smoking ($p<0.001$). No significant overall differences in salience, seriousness or believability of health warnings were found between the pack types, but participants reported looking more closely at the warnings on plain packs and also thinking more about what the warnings were telling them ($p<0.001$). Participants reported being more likely to engage in avoidant behaviours, such as hiding or covering the pack ($p<0.001$), and cessation behaviours, such as foregoing cigarettes ($p<0.05$), smoking less around others ($p<0.001$), thinking about quitting ($p<0.001$) and

reduced consumption ($p<0.05$), when using the plain packs. Results did not differ by dependence level or socio-economic status.

Conclusions: No research design can capture the true impacts of plain packaging prior to its introduction, but this study suggests that plain packaging may help to reduce cigarette consumption and encourage cessation in the short-term.

ARTICLE SUMMARY

Article focus

- How young adult women smokers respond to using plain cigarette packaging, in comparison to fully branded cigarette packaging. We explored the impact of plain packaging on short-term smoking related behaviour

Key messages

- Plain packaging was associated with lower ratings of enjoyment and satisfaction of smoking in comparison with fully branded packaging
- Participants reported looking more closely at the health warnings on plain packs and also thinking more about what the warnings were telling them
- Plain packaging, in comparison with fully branded packaging, was associated with forgoing cigarettes, smoking less around others, increased thoughts of cessation and reduced consumption

Strengths and limitations

- The main strength of the study is that it allows an insight into how smokers respond to plain packaging before it has been introduced
- The main limitations are the novelty of ~~the~~ plain packaging and reliance on self-reported smoking behaviour

Introduction

At the annual meeting of the Canadian Medical Association in 1986 it was proposed that all tobacco products should come in 'plain' brown standardised packs in order to minimise their attractiveness.[1] Approximately a quarter of a century on and plain tobacco packaging ~~will be introduced~~ was fully implemented in Australia, for the first time, ~~for all tobacco products in Australia from~~in December 2012. Prior to this, consultations on plain packaging ended in New Zealand in October and in the United Kingdom (UK) in August 2012. What the actual impacts of plain packaging will be, if any, remains to be seen however. A recent systematic review of the plain packaging literature, with 37 included studies, suggests that plain packaging may have a number of potential public health benefits, including: 1) reducing the appeal of the packaging and of cigarettes, ~~product and user,~~ 2) increasing the salience, believability and seriousness of the health warnings, although this was influenced by the type (pictorial or text), size and strength of the warnings used, and 3) increasing perceptions of harm, although this was dependent upon the colour of the plain pack, with darker coloured plain packs typically perceived as more harmful, and lighter coloured plain packs less harmful, than fully branded cigarette packs.[2]

One of the longstanding criticisms of the literature is that existing research typically involves gauging consumer response to plain packaging following brief exposure in a controlled environment and, as a result, fails to capture how consumers would react to and use plain packs over time in naturalistic settings. To date only one study has attempted a real world test of plain packaging. ~~,~~ This study used~~ing~~ a design which involved young adult men and women smokers in Glasgow (Scotland) transferring cigarettes from their own packs into plain packs provided and using these packs instead of their own packs for two weeks, and their own packs for two weeks ~~to allow for comparison~~.[3] Participants completed a questionnaire twice a

week throughout the study to allow for comparisons to be made between the plain packs and their own packs. Pack perceptions and feelings, and feelings about smoking, were more negative for plain packs, and participants were more likely to report avoidant behaviours (e.g. covering the pack) and cessation related behaviours (e.g. thinking about quitting) when using the plain packs. Post-study interviews were conducted with a sub-sample of participants (N=18) to explore their experiences of using the brown (plain) packs. In the post-study interviews women were more likely than men to report avoidant behaviour when using the plain packs, and only women reported reduced consumption when using plain packs. The pilot nature of this study, recruitment within a single city, low retention rate (34%) and relatively small final sample (N=48) means that further research is needed to test these findings.

We aimed to extend this previous study by following the same approach but with a larger and more nationally distributed sample of young adult women smokers, who appeared to be more influenced by pack design than men in the pilot study. While high rates of smoking among women tend to be the norm in most of Europe, with a prevalence of 20% or more in all but four of EU member countries (Italy, Portugal, Slovakia and Sweden), this contrasts sharply with much of the rest of the world.[4] Prevalence of smoking among women is less than 20% in the Middle East, North and Central America and Asia (excluding Lebanon and Nepal), and less than 10% in Africa, where figures are available.[4] In the UK smoking prevalence among women is currently 20% and in long-term decline, but prevalence is declining at a slower rate than for men and ~~even so prevalence~~ remains particularly high for young adult women, with 25% of 25-34 year old women and 30% of 20-24 year old women smokers.[5]

The high smoking rates among young women in the UK represents a significant future burden of both mortality and morbidity should this trend not be reversed. With a growing number of slim, elegant cigarette packs targeted at young women being brought to market in the UK and elsewhere within the last five years, and given that the aesthetic appeal of cigarette packaging appears to be more important for young women than for young men,[3,6,7,8] plain packaging may have a role to play in reducing the high rates of smoking among young women. This study explored young women's experiences of using plain cigarette packaging as they went about their everyday lives.

Methods

Design and sample

Between June 2011 and March 2012 young adult ~~female~~ women smokers (N=301) were recruited from eight postcode sectors from within the six most populated towns and cities in Scotland (Glasgow, Edinburgh, Aberdeen, Dundee, Paisley, East Kilbride) using random location quota sampling. The postcode sectors were randomly selected, stratified by DEPCAT score, which is a measure of multiple deprivation, to ensure coverage of a range of socio-economic backgrounds. Within each postcode sector, market recruiters were instructed to recruit either six or seven participants, using the door knock method, according to quota controls on age (18-24 / 25-35) and daily consumption (light, moderate smokers were defined as those smoking 14 cigarettes a day or less / heavy smokers as those smoking 15 cigarettes a day or more).

~~All potential participants were informed by~~The market recruiters, who were briefed about the study protocol but blind to the purpose of the study, informed all potential participants that the study was concerned with smokers' opinions of cigarette packaging. If individuals were

willing to participate and available for the duration of the study, they were asked to complete a recruitment questionnaire, which included the Fagerström Test for Nicotine Dependence[9] and questions regarding brand variant smoked, risk perceptions and cessation behaviour (e.g. motivation to quit, attempts to quit). To ensure only smokers were recruited participants were asked to provide a breath ~~test~~ sample using a piCO^{+}™ Carbon Monoxide monitor (Bedfont Scientific) and also an empty cigarette pack; in the four instances where a participant only had a full pack, recruiters took a photo of their pack and texted this to a member of the research team. Ethics approval was obtained from the ethics committee of the Marketing Department at the University of Stirling. Participants provided informed consent before taking part.

Materials and procedure

Participants were informed about the study protocol by market recruiters and, if they gave consent, were provided with a 'completion' pack. ~~The~~ Each completion pack ~~contain~~included~~:~~ seven brown (plain) cigarette packs. These brown packs were only suitable for participants who smoked King Size cigarettes, as was the case in a pilot study using the same approach.[3] As nine of the top ten selling cigarette brand variants in the UK come in King Size packs most smokers would have been eligible for study inclusion. However, as all of the top 25 selling cigarette brand variants in the UK come in either King Size or Superkings packs,[10] which are slightly bigger than the standard King Size pack, market recruiters were given a box of Superkings plain packs and instructed to use these where appropriate. This involved replacing the seven King Size brown packs within the completion pack with seven Superkings brown packs if an individual smoked a Superkings brand or other longer cigarettes, such as Slims or Superslims. T~~T~~he plain packs were otherwise identical, with~~with had~~ a fictitious brand name Kerrods, to prevent copyright breach, ~~but~~ and all

relevant legal markings and a barcode.~~;~~ The completion packs also included five numbered questionnaires, labelled by day and date,~~;~~ and a timetable explaining when to use their own packs and the Kerrods packs and when to complete and return each of the five questionnaires.

The study, which always started on a Monday, ran for two weeks. Participants were instructed ~~For either the first or second week, participants were instructed~~ to transfer cigarettes from their own packs into the Kerrods packs supplied to them and use these for one week of the study, and their own packs for the other week of the study.~~;~~ O~~o~~rdering was randomised so that ~~with~~ half the sample used~~ing~~ the plain pack in the first week of the study and half in the ~~last~~ second week. Participants were instructed to retain and re-use the Kerrods packs if they smoked more than 20 cigarettes in a day. In the UK cigarette packs contain one of two text health warnings ~~used~~ on the front ('Smoking kills' or 'Smoking seriously harms you and others around you') and one of fourteen 'pictorial' warnings ~~used~~ on the reverse panel, although three are in fact text warnings as they do not display a picture, photo, pictogram or symbol. All ~~the~~ Kerrods packs had the same warning on the pack front (Smoking kills) and one of three 'pictorial' warnings on the reverse panel showing either; a set of healthy and diseased lungs, ~~an image of~~ smoke in a child's face~~,~~ or a text warning about seeking help (see Figure 1). Past research has found these three warnings to have high (lungs), medium (smoke in child's face) and low salience (seeking help) among smokers.[11] Each completion pack contained at least two packs with each of the three warnings. We included packs with different health warnings ~~and they were used~~ to reflect the types of warnings ~~which~~ that smokers receive on packs and prevent all packs featuring only warnings found to have high or low salience, as this could potentially influence response to the warning items.

Figure 1 here

Participants were instructed to complete five questionnaires during the two weeks of the study. Questionnaires 1 and 2 were to be completed and returned, via pre-addressed envelopes or by email, on the Thursday and Sunday respectively of the first week. Questionnaires 3 and 4 were to be completed and returned on the Thursday and Sunday respectively in the second week. Thes~~e~~ first four questionnaires, which were identical (~~, and were to be completed~~ twice a week ~~(each Thursday and Sunday) and returned them via pre-addressed envelopes or by email,~~ see Appendix 1), ~~for questionnaire used. This~~ resulted in two questionnaires relating to their experience of the plain packs and two relating to their own pack.~~:~~ Q~~q~~uestionnaire ~~number~~ 5 included the same questions as the pre-study questionnaire about risk perceptions and cessation behaviour, and was to be completed and returned on the same day as questionnaire 4 to reduce participant burden. This~~but~~ is not included in this analysis.

Although the day and date each questionnaire was to be completed and returned was highlighted on the front cover and specified in the timetable, in an attempt to increase study compliance the research team sent a text message ~~was sent~~ to each participant the day before study onset, always a Sunday. The text reminded participants: 1) that the study would start the next day, 2) what packs they were to use for the coming week, and 3) to complete questionnaire 1 the following Thursday (the day and date was given for clarity). A second text message was sent the following Sunday to remind participants to complete and return questionnaire 2 that day, and on which packs to use for the following week. A third and final text was sent the subsequent Sunday, reminding participants to complete and return questionnaires 4 and 5 that day. Participants were also sent a reminder letter during the first

week of the study and an email was sent every Thursday and Sunday morning to participants who had provided an email address as an additional reminder to complete and return the questionnaires. To encourage the return of all the questionnaires participants were informed that on top of the participation fee (£15.00) they would receive an incrementally greater payment for each questionnaire returned; £2.50 if they returned one questionnaire, £7.00 if they returned two questionnaires, £12.00 for three, £20.00 for four and £30.00 for all five. Participants were provided with an information sheet to remind them of this incremental payment plan.

Analysis

Prior to analysis, some items were recoded to ensure the same direction of coding and thus facilitate creation and interpretation of composite variables. Composite scores were derived for pack perceptions, pack feelings, feelings about smoking, and response to warnings, by summing the individual items within each and then rescaling to a five-point scale. Cronbach's alpha was acceptable for each, all above 0.70 with the exception of the overall health warning response for own pack which had an alpha of 0.65, thus supporting the decision to create composite scores for each measure and for each pack type.

Ratings between fully branded and Kerrods plain packs were compared. Ratings collected on the Thursday questionnaires are referred to as 'midweek' and those collected on the following Sunday referred to as 'weekend'. For each analysis, midweek ratings of the Kerrods pack were compared with midweek ratings of their own pack and weekend ratings of the Kerrods pack were compared with weekend ratings of their own pack~~T and to ensure that packs were compared against equivalent time points, ratings of the plain pack at the first and second measures were compared with ratings of their own pack at the first and second~~

measures, respectively. For each time point, pPaired t-tests were used to produce mean scores for the plain Kerrods packs relative to mean scores for their own pack. Given the ordinal nature of the five-point scales, the Wilcoxon Signed Rank test was used to test for differences between ratings of the plain Kerrods packs versus participant's own packs at each measure. As the data on avoidant/cessation behaviours were binary (yes/no) the McNemar test was used to test for differences in response between participants' first and second measure on the plain pack and the respective measure on their own packto the Kerrods pack versus their own pack. The number of avoidant/cessation behaviours associated with each pack was also counted and paired t-tests were used to test for differences in the mean number of actions taken with the Kerrods pack versus their own pack. Similarly, paired t-tests were used to test for differences in mean reported daily consumption when using the Kerrods pack versus their own pack. Comparisons across time were also made by comparing the midweek composite scores for the Kerrods pack versus the weekend composite scores for the Kerrods pack and comparing the midweek composite scores for their own pack versus the weekend composite scores for their own pack. The Wilcoxon Signed Rank test was used to test for differences, across time, in the composite scores. Paired t-tests were used to test for differences between midweek and weekend reports on the number of avoidant/cessation behaviours and reported daily consumption with each pack at each measure. Composite scores for each pack type were also compared across the two time-points, using Wilcoxon Signed Rank test, to examine whether composite ratings for each pack type was consistent across time. Paired t-tests were used to compare, at each time-point, reported daily consumption when using the Kerrods pack versus their own pack.

Given the paucity of plain packaging research exploring sub-group differences,[2] analyses of the composite scores were also run separately to explore whether the results were consistent

by age group (18-24, 25-35), social grade (ABC1, C2DE) and dependence level (lightow/moderateedium, high). Social grade was measured via occupation of the participant, using a social grading scale HOW WAS IT CALCULATED?. Social grade, based on occupation, was classified in accordance with the six groups (A – upper middle class; B – middle class; C1 – lower middle class; C2 – skilled working class; D – working class and E – those at lowest level of subsistence) used by the British National Readership Survey. These six groups were combined to form two groups to enable broad comparison between middle class (ABC1) and working class (C2DE) participants. Dependence level was measured via the Fagerström Test for Nicotine Dependence,[9] with those scoring between 0-5 categorised as having lightow/moderateediu -dependence and those scoring 6-10 high dependence levels.

RESULTS

Of the 301 participants recruited, 54 (17.9%) were non-completers, who failed to participate at all after completing the pre-study questionnaire, 59 60 (19.69%) were partial completers, who failed to return all the questionnaires or reported using the incorrect pack (e.g. they used their own packs when they were meant to be using the Kerrods packs), and 188 187 (62.51%) were full completers, who returned all the questionnaires and reported using the correct packs. Results presented in this paper are based on the full completers. The average age of the full completers was 27.14 years (sd 5.63);, 84 (44.9%) were from social grade ABC1 and 103 (55.1%) from social grade C2DE;, 96 (51.3%) had light/moderate dependence and 91 (48.47%) high dependence;, and average daily cigarette consumption was 17.28 (sd 7.19); 33 (17.6%) had given up for one day or more in the previous month and 129 (69.0%) indicated that they would like to or really wanted to give up smoking. There was no significant difference in terms of age, dependence level or motivation to quit between those included in the analyses and those excluded (non-completers and partial completers). However,

participants from social group ABC1 were more likely to complete the study fully (71.2% of ABC1s were full completers v 56.6% of C2DEs, p<0.05) as were participants with a past month quit attempt of one day or more (78.6% of those with a past month quit attempt completed the study fully v 59.7% of those with no past month quit attempt, p<0.05).

Pack Perceptions

On average, participants rated Kerrods negatively on all pack perceptions (not stylish, unfashionable, cheap, uncool, unattractive, poor quality, unappealing), with mean scores ranging from 1.55 to 2.37; lower scores indicating more negative perceptions (see Table 1a). For their own packs the higher mean scores, ranging from 2.91 to 3.69, indicated more positive pack perceptions. For the overall pack perception score (all items combined), participants rated the Kerrods pack more negatively than their own pack, and this did not vary across time for either pack. Results were consistent by age group, social grade and dependence level.

Table 1 here

Pack Feelings

On average, participants reported more negative feelings (embarrassed, ashamed, unaccepted) about using the Kerrods pack, relative to their own pack (see Table 1b). For the Kerrods pack, mean scores ranged from 2.54 to 3.10, whereas mean scores for their own pack ranged from 3.26 to 4.08. For both their own packs and the Kerrods packs, overall pack feelings were rated more negatively at the weekend compared with midweek (p<0.001)~~second measure~~. Results were consistent by age group, social grade and dependence level.

Feelings about smoking

Participants reported more negative feelings about smoking from the Kerrods pack, in terms of enjoyment, satisfaction and feeling good, ~~from the Kerrods pack~~relative to their own pack (see Table 1c). For the Kerrods pack, mean scores ranged from 2.68 to 2.99~~3.13 to 3.52~~, w~~W~~hile mean scores for their own packs ranged from ~~2.68 to 2.99~~ 3.13 to 3.52. ~~participants, on average, rated the smoking experience with their own pack as more 'enjoyable' (mean scores 3.40) and 'satisfying' (mean scores 3.41 to 3.52), for Kerrods the average ratings suggested they were less enjoyable (mean scores 2.73 to 2.90) and satisfying (mean scores 2.83 to 2.99). Participants were more likely to feel 'good' about smoking when using their own packs (mean scores 3.13 to 3.19) than when using the Kerrods pack (mean scores 2.68 to 2.73).~~ Overall ratings for their own packs did not vary across time. For the Kerrods pack, overall feelings about smoking were rated more negatively at the weekend compared with midweek ~~second measure~~ ($p<0.05$). Results were consistent across age group, social grade and dependence level.

Health warnings

Salience, seriousness and believability

For both pack types, the on-pack health warnings were rated as being noticeable (mean scores 3.41 to 3.44), serious (3.83 to 3.94) and believable (3.91 to 4.10), see Table 2. At the weekend ~~second measure~~ only, warnings on the Kerrods pack~~s~~ were rated as more believable relative to participants' own packs. However, overall ratings of the warnings did not differ between the packs, and did not vary across time for either pack. Findings were consistent across age, social grade and dependence level.

Table 2 here

Attention and depth of processing

Warnings were rated as being read more closely on the Kerrods pack (mean scores 2.97 to 3.00) than on their own packs (mean scores 2.28 to 2.58), and thought about more on the Kerrods pack (mean scores 3.02 to 3.16) relative to participants' own packs (mean scores 2.52 to 2.80). The overall results were consistent for the age and dependence level sub-groups. However, at the weekend~~second measure~~, participants from social grade C2DE did not show any significant difference, between Kerrods and own pack, in overall warning action response. While there was no difference in the overall Kerrods ratings~~measures~~ across time, the own pack ratings were stronger at the weekend ~~second own pack measure~~ compared with ~~the~~ midweek ~~first measure~~ ($p<0.001$).

Avoidant behaviour/Behaviour change

~~Across the two measures, p~~Participants always indicated greater occurrence of the following actions when using the Kerrods packs: keeping the pack out of sight; covering the pack; foregoing cigarettes; smoking less around others; thinking about quitting (Table 3). In addition, when using the Kerrods pack, participants were ~~always~~ more likely to stub out a cigarette, although only significantly so at the weekend~~second measure~~. They were also more likely to want to quit smoking, when using the Kerrods pack, though only significantly so at midweek. On average, participants reported a higher number of behaviour changes or avoidant behaviours when using the Kerrods pack (1.88 and 2.29 ~~at the first and second measures~~midweek and weekend respectively) compared with their own pack (0.84 and 1.12 ~~at the first and second measures~~midweek and weekend respectively). This result was consistent by age, social grade and dependence level. For each pack type, the number of

behaviour changes/avoidant behaviours increased at the weekend ~~second measure~~ (p<0.001 for Kerrods and p<0.01 for own pack).

Table 3 here

~~At each measure, r~~Reported consumption was always lower with the Kerrods pack compared with participants' own pack. ~~For the first measure,~~Midweek average daily consumption was 14.9 when using Kerrods and 15.5 when using their own pack (p<0.05), with weekend average daily consumption ~~at the second measure~~ 15.7 when using Kerrods and 16.7 when using their own pack (p<0.01). The pattern of lower consumption, when using the Kerrods pack versus their own pack, was observed within each of the age, social grade and dependence level sub-groups, but did not always reach significance. Consumption was higher at the weekend ~~second measure~~ for each pack (p<0.05 for Kerrods and p<0.01 for own pack).

~~Table 3 here~~

Discussion

For young adult ~~female~~ women smokers, a key target group for public health, the use of dark brown (plain) cigarette packs in naturalistic settings was associated with more negative perceptions and feelings about the packaging and about smoking than for their own fully branded packs. As with past research in the UK the base colour of the plain packs, a faecal brown, was perceived negatively.[3,7,12,13] Plain packs were also associated with more negative feelings about the pack, in terms of embarrassment and shame, lower ratings of enjoyment and satisfaction of smoking, and increased avoidant (hiding and covering the pack) and cessation related smoking behaviours (stubbing out cigarettes early, forgoing cigarettes and

reduced consumption). These findings closely reflect those of a pilot study using the same approach.[3] The key differences to emerge between the studies were that in the pilot study stubbing out cigarettes early when using the plain packs was never significant and forgoing cigarettes when using plain packs was not always significant. As level of consumption was not measured in the pilot study questionnaires no comparisons can be made.

Study strengths

The study permits an insight into how smokers respond to plain packaging in natural settings before it has been introduced. It is difficult to envisage an alternative approach which would allow smoking related behaviours to be captured, such as stubbing out cigarettes early, forgoing cigarettes and reduced consumption. Similarly, as the study did not involve forced exposure to packaging it more accurately reflects how smokers respond to the on-pack health warnings, in respect to the attention they are given, how they are perceived and also how deeply they are processed. There were no significant overall differences in ratings of warning salience, seriousness and believability, consistent with a pilot naturalistic study and two recent eye-tracking studies from the UK.[3,14,15] Warning design may, in part, help explain these findings. The positioning of images only on the reverse panel of packaging is inconsistent with the Guidelines for Article 11 of the Framework Convention on Tobacco Control[16] and best international practice. Indeed,~~;~~ ~~only two~~very few countries outside of Europe that require pictorial warnings to be displayed on cigarette packs, such as Argentina and ~~Brazil and~~ Venezuela, fail to use pictorial warnings on the pack front~~)~~. Including pictorial warnings only on the reverse panel of packaging ~~and~~ has been found to reduce warning effectiveness.[9,~~16~~] Similarly, lack of rotation is likely to have increased wear-out; although images appeared on the reverse panel of packs in the UK in 2008 to support the warning text, the~~se~~ text has been on packs since 2003. Warnings on plain packs were read more closely and

thought about more than on fully branded packs however. That warnings on plain packs were attended to more closely and more deeply processed, which was not assessed in the pilot study, ~~has not, we believe, been previously reported in the plain packaging literature, and as such~~ advances our understanding of the possible real-world impacts of plain packaging.

It is not only cessation related behaviours such as stubbing out or forgoing cigarettes which can be captured with such an approach, but also behaviours such as smoking less around other people. The UK Department of Health speculate that a potential benefit of plain packaging could be to reduce exposure to second-hand smoke (SHS) from reduced rates of smoking,[17] which would reduce the high annual direct costs to the NHS incurred by treating illness related to exposure to SHS.[18] That young women reported smoking less around others when using the plain packs suggests that the appearance of the pack, and how it makes some young women feel and think about smoking, may in itself lead to lower exposure to SHS. The Department of Health also suggested that future research consider consumer response to plain packaging across socioeconomic groups,[17] which is somewhat surprisingly lacking in the existing literature.[2] We found no significant differences across income group, or indeed by age or dependence level. While this suggests that plain packaging ~~e~~could potentially~~an~~ help benefit all young women, caution should be exercised as the sample size did not permit a more detailed breakdown of socio-economic status or dependence.

Limitations

The study has a number of limitations. The reliance on self-reporting, both in terms of reported behaviour change and the use of the Kerrods packs, is a potential limitation. G~~,~~ ~~although g~~iven the high level of participant involvement and the nature of the research it is difficult to see a viable alternative. One way would have been to provide participants with

their brand of cigarettes already within the plain packs, which would eliminate the need for cigarettes to be transferred from one pack into another, but ethical concerns prohibited us from doing so. While the generic brand name (Kerrods), used to avoid breach of copyright, was intended to be neutral and has previously been found to have no positive or negative associations among smokers,[7] it is nevertheless possible that this may have had an impact on participant's perceptions of plain packaging. The findings cannot be generalised to all young women smokers and provides no insight into the impact of plain packaging on older women smokers, male smokers or non-smokers, although the exclusive focus on young women was taken given high smoking prevalence among this group. It is also possible that participants may respond differently if only plain packs were available on the legitimate market. Clearly, the true impacts of standardising the appearance of all legitimate cigarette packs on the market remain unclear. Research in Australia can help shed further light on the impacts of plain packaging. However, ~~but~~ given that Australia has ~~has~~ strong~~er~~ tobacco control, ~~and lower prevalence of nicotine use than~~ the largest on-pack warnings in the world and low prevalence of nicotine use, ~~anywhere in the European Union (EU), and as the appearance of plain packaging in Australia would almost certainly differ from that of plain packs in the EU, at least in terms of the size, type and positioning of the on-pack health warnings, the~~ further research in Europe and elsewhere using approaches that more closely approximate what consumers experience when using plain packs in naturalistic settings is required.

Implications for policy makers and clinicians

As a number of governments ~~and executive bodies~~ consider the merits of plain packaging as a policy measure these findings may help inform the decision making process. It is ultimately for policy makers to assess the potential value of plain packaging as part of a comprehensive suite of tobacco control measures aimed at reducing consumption and prevalence, but the

collective evidence generally provides support for plain packaging, irrespective of design, location and sample.[2] This study extends this growing body of evidence and is the first to find that smokers were more likely to stub out cigarettes early and reduce consumption when using plain packs. These findings are relevant to the National Institute for Health and Clinical Excellence (NICE) draft guidelines on harm-reduction approaches to smoking, published in October 2012,[19] which positions quitting as the target but points to potential health benefits of consuming fewer cigarettes, or less of each cigarette. Further research that ~~is required to~~ provid~~e~~se ~~greater~~ insight into the impacts of plain packaging on smoking behaviour, and more broadly what the health benefits, if any, of reduced consumption and intake are,[19] would be of value. However, ~~but~~ the present~~se~~ findings contribute to the harm-reduction debate and suggest that plain packaging may have a role to play in this proposed harm-reduction approach.

The study also points to opportunities for clinicians. While plain packaging was found to increase thoughts of quitting, even when using their own packs between a quarter and a third of young women reported thinking about and wanting to quit. Smoking rates are higher among young women than for older women and for males of any age,[5] and prevalence among 20-24 year olds has declined at a slower rate than for any other age group in the last quarter of a century, from 35% in 1984 to 30% in 2010.[5] As such, the desire to change among a significant percentage of such a key target group suggests that ~~this group~~young women may benefit from intervention by clinicians or health care professionals.

Notes

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Competing interests: None.

Ethical approval: The study obtained ethics approval from the ethics committee of the Marketing Department at the University of Stirling. Participants provided informed consent before taking part.

Data sharing: No additional data available.

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Table 1. Mean ratings on response to Kerrods pack v Own pack for pack perceptions, pack feelings and feelings about smoking

	~~1st Measure~~Midweek		~~2nd~~ ~~Measure~~Weekend	
	Kerrods	**Own**	**Kerrods**	**Own**
	mean	mean	mean	mean
	sd	*sd*	*sd*	*sd*
a) Pack Perceptions (7 items)				
Style	1.55	3.16***	1.62	3.23***
not stylish(1)/stylish(5)	*0.88*	*0.99*	*0.90*	*0.98*
Fashion	2.30	3.07***	1.88	3.08***
unfashionable(1)/fashionable(5)	*1.53*	*1.03*	*1.22*	*1.02*
Cheap	1.74	3.30***	1.90	3.37***
cheap(1)/expensive(5)	*0.99*	*1.08*	*1.02*	*1.03*
Cool	1.74	2.95***	1.76	2.91***
uncool(1)/cool(5)	*0.87*	*0.99*	*0.89*	*0.94*
Attractive	1.78	3.03***	1.72	3.07***
unattractive(1)/attractive(5)	*1.15*	*1.14*	*0.99*	*1.05*
Quality	2.37	3.69***	2.26	3.64***
poor quality(1)/good quality(5)	*1.16*	*0.95*	*1.11*	*0.93*
Appealing	1.81	3.19***	1.85	3.16***
unappealing(1)/appealing(5)	*1.06*	*1.08*	*1.04*	*0.97*
Overall Pack Perceptions				

Composite score	1.90	3.19***	1.85	3.21***
Low score = negative perceptions / High score = positive perceptions	*0.72*	*0.07*	*0.73*	*0.76*
b) Pack Feelings (3 items)				
Embarrassment	2.70	4.08***	2.54	3.84***
embarrassed(1)/not embarrassed(5)	*1.29*	*1.14*	*1.25*	*1.04*
Ashamed	3.10	4.02***	2.71	3.72***
ashamed(1)/not ashamed(5)	*1.26*	*1.12*	*1.18*	*1.08*
Acceptance	2.69	3.37***	2.55	3.26***
unaccepted(1)/accepted(5)	*1.02*	*1.07*	*0.95*	*0.99*
Overall Pack Feelings				
Composite score	2.84	3.82***	2.60	3.62***
Low score = negative perceptions / High score = positive perceptions	*1.03*	*0.92*	*0.99*	*0.86*
c) Feelings about smoking (3 items)				
Enjoyment	2.90	3.40***	2.73	3.40***
enjoyable(1)/ enjoyable(5)	*0.97*	*0.95*	*0.97*	*0.96*
Satisfaction	2.99	3.52***	2.83	3.41***

not satisfying(1)/satisfying(5)	*0.99*	*0.93*	*1.00*	*0.98*
Good	2.73	3.13***	2.68	3.19***
bad(1)/good(5)	*0.87*	*0.93*	*0.95*	*0.98*
Overall Feelings Smoking				
Composite score	2.88	3.36***	2.75	3.34***
Low score = negative perceptions / High score = positive perceptions	*0.82*	*0.83*	*0.89*	*0.87*

*** p<0.001; ** p<0.01; * p<0.05

Table 2. Mean ratings on response to Kerrods pack v Own pack for health warning salience and credibility, and attention and depth of processing

	~~1st Measure~~Midweek		~~2nd Measure~~Weekend	
	Kerrods	**Own**	**Kerrods**	**Own**
Health warnings (salience and credibility)	mean *sd*	mean *sd*	mean *sd*	mean *sd*
Noticing	3.44	3.43	3.41	3.25
hardly noticeable(1)/very(5)	*1.39*	*1.33*	*1.40*	*1.29*
Seriousness	3.94	3.83	3.84	3.89
not serious(1)/ serious(5)	*1.12*	*1.12*	*1.26*	*1.04*
Believability	4.10	4.08	4.09	3.91*
Not believable(1)/ believable(5)	*1.09*	*0.98*	*1.09*	*1.06*
Overall Warning Response				
Composite score	3.92	3.77	3.77	3.67
Low score = little, no impact / High score = high impact	*0.97*	*0.93*	*1.01*	*0.88*
Health warnings (attention and depth of processing)				
Attention	3.00	2.28***	2.97	2.58***
not looking	*1.47*	*1.34*	*1.51*	*1.35*

closely(1)/looking closely(5)				
Thinking about warnings	3.02	2.52***	3.16	2.80***
not think about what they are telling you(1)/thinking about what they are telling you(5)	*1.41*	*1.36*	*1.47*	*1.34*
Overall Warning Action Response				
Composite score Low score = little or no action / high score = high action	3.00 *1.38*	2.39*** *1.26*	3.06 *1.42*	2.69*** *1.27*

*** p<0.001; ** p<0.01; * p<0.05

Table 3: Proportion of participants reporting avoidant behaviour or behaviour change as a result of the pack

	~~1st Measure~~Midweek		~~2nd Measure~~Weekend	
Behaviour change / avoidant behaviour	**Kerrods %**	**Own %**	**Kerrods %**	**Own %**
Stub out cigarette	10	5	17	10*
Forego a cigarette	13	4**	15	~~10~~8*
Keep pack out of sight	~~53~~54	11***	55	10***
Cover pack	10	2***	~~10~~21	~~2~~3***
Smoke less around others	~~21~~33	~~3~~11***	39	16***
Think about quitting	39	26***	46	34***
Want to quit	33	25*	37	32
Mean number of actions	1.88	0.84***	2.29	1.12***
sd	*1.80*	*1.36*	*2.16*	*1.61*

*** p<0.001; ** p<0.01; * p<0.05

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PACKAGING SURVEY 2011

Questionnaire 1

COMPLETE AND RETURN ON THURSDAY 18TH AUGUST

What it's about

We want to find out how you feel about using particular cigarette packs. Please answer the questions on the day and date highlighted above and return it, **on this same day**, to Diane Dixon at University of Stirling using one of the FREEPOST envelopes provided.

Please read the questions carefully and try to answer each one. There are no right or wrong answers. It is your views that we are interested in.

How to answer

When answering the questions, just think about the pack you used today, whether it is your own pack or the brown pack that you were provided with.

In most of the questions you are asked to put a cross in a box, to show which of the two responses is closest to what you think. The closer the box is to the response the more strongly you agree with it.

EXAMPLE How do you feel about travelling by train?

(Please put a cross in only ONE box, on each line, to show what you think)

	1	2	3	4	5	
Dislike a lot	☐	☐	☐	☒	☐	Like a lot
Comfortable	☒	☐	☐	☐	☐	Not comfortable

CONTINUED ON P.2

Q1 Which pack did you use today?

(Please put a cross in only ONE box)

The brown pack (Kerrods)	☐	1
Your own pack	☐	2

Q2 What do you think of the pack that you used today?

(Please put a cross in only ONE box, on each line, to show what you think)

		1	2	3	4	5	
1	Not stylish	☐	☐	☐	☐	☐	Stylish
2	Fashionable	☐	☐	☐	☐	☐	Unfashionable
3	Cheap	☐	☐	☐	☐	☐	Expensive
4	Uncool	☐	☐	☐	☐	☐	Cool
5	Attractive	☐	☐	☐	☐	☐	Unattractive
6	Poor quality	☐	☐	☐	☐	☐	Good quality
7	Appealing	☐	☐	☐	☐	☐	Unappealing

Q3 How did the pack you used today make you feel?

(Please put a cross in only ONE box, on each line, to show what you think)

		1	2	3	4	5	
1	Embarrassed	☐	☐	☐	☐	☐	Not embarrassed
2	Ashamed	☐	☐	☐	☐	☐	Not ashamed
3	Accepted	☐	☐	☐	☐	☐	Unaccepted

Q4 How did the pack you used today make you feel about smoking?

(Please put a cross in only ONE box, on each line, to show what you think)

		1	2	3	4	5	
1	Enjoyable	☐	☐	☐	☐	☐	Not enjoyable
2	Satisfying	☐	☐	☐	☐	☐	Not satisfying
3	Bad	☐	☐	☐	☐	☐	Good

CONTINUED ON P.3 ⇨

Q5 What do you think about the health warnings that were on the pack you used today?

(Please put a cross in only ONE box, on each line, to show what you think)

		1	2	3	4	5	
1	Hardly noticeable	☐	☐	☐	☐	☐	Very noticeable
2	Serious	☐	☐	☐	☐	☐	Not serious
3	Not believable	☐	☐	☐	☐	☐	Believable

Q6 Still thinking about the warnings that were on the pack you used today, did you...?

(Please put a cross in only ONE box, on each line, to show what you think)

		1	2	3	4	5	
1	Look closely at them	☐	☐	☐	☐	☐	Not look closely at them
2	Think about what they were telling you	☐	☐	☐	☐	☐	Not think about what they were telling you

---

Q7 Did the pack you used today cause you to do any of the following?

(Please put a cross in only ONE box, on each line)

		Yes	No
		1	2
1	Stub out a cigarette before you had finished it?	☐	☐
2	Stop you from having a cigarette when you were about to smoke one?	☐	☐
3	Keep the packet out of sight?	☐	☐
4	Cover the pack (using a cigarette case for example)?	☐	☐
5	Smoke less around others?	☐	☐
6	Think about quitting smoking?	☐	☐
7	Want to quit smoking?	☐	☐

Q8 Approximately how many cigarettes did you smoke yesterday?

(Please write in number below)

.....

CONTINUED ON P.4

Q9 If you have any comments that you wish to make about the pack you used today please use the space below.

.....

.....

.....

.....

.....

.....

What to do now

Please check you have answered all the questions and then return it, **today**, in one of the envelopes provided. There is no need to use a stamp. If you have lost one of the envelopes, our FREEPOST address is:

Diane Dixon
Freepost RLTB-ZEES-HBRH
Institute for Social Marketing
University of Stirling
STIRLING
FK9 4LA